Z. Säugetierkunde **65** (2000) 121–123

http://www.urbanfischer.de/journals/saeugetier

ZEITSCHRIFT FÜR SÄUGETIERKUNDE
INTERNATIONAL JOURNAL OF MAMMALIAN BIOLOGY

WISSENSCHAFTLICHE KURZMITTEILUNGEN

Eudiscopus denticulus (Osgood 1932) in Thailand with notes on its roost (Chiroptera: Vespertilionidae)

By D. Kock and D. Kovac

Forschungsinstitut Senckenberg, Frankfurt a. Main

Receipt of Ms. 15. 06. 1999
Acceptance of Ms. 11. 08. 1999

Key words: *Eudiscopus denticulus*, Thailand, size, roosting behaviour, bamboo phytotelmata

The monotypic genus *Eudiscopus* Conisbee, 1953 is endemic in central SE. Asia. *E. denticulus* (Osgood 1932) was described from six specimens collected at Phong Saly, 21°40′N–102°06′E, N. Laos. Two females of this species were recorded by Koopman (1970) from Yetho River (not localised), Pegu Yoma, southern Central Myanmar (Burma), and two males from Song Ma, Son La, 21°20N′–103°55′E, NW. Vietnam, by Cao Van Sung (1976) and Dang Huy Huynh et al. (1994).

On May 1, 1999, the fauna of the internodes of giant bamboo, *Gigantochloa* sp. (Gramineae), was studied in Khlong Lan National Park, ca. 16°13′N–99°17′E, Kamphaeng Phaet (= Phet) Prov., W. Thailand by the junior author. Opening an internode approximately 5.5–6 m above ground, a frog was found and in the internode adjoining below seven bats were discovered. They obviously differed in coloration from the common bamboo-inhabiting flat-headed bats, *Tylonycteris pachypus* (Temminck 1849) and *T. robustula* Thomas, 1915. One individual which had its wings hurt during the sawing operation to open the internode was preserved in alcohol for documentation. The remaining 6 individuals took flight.

Upon examination it proved to be the rare *E. denticulus* (SMF 88495). It possesses all diagnostic characters of previous descriptions, e. g. reddish brown coloration, large pads on hind feet, longish ears, long and broad rounded-tipped tragus, flattened skull with broad rostrum and three lower premolars, the central one intruded from the toothrow (Osgood 1932; Koopman 1970, 1972; Hill 1992); additionally the thumb is relatively short and thick.

The adult female is of the following dimensions in mm: Head and body 43; tail 36; hindfoot s. u. (without pad) 5.15; tibia 16.8; ear 13.5; forearm including carpalia 36.6; 5th finger 48.3.

Skull: Greatest length to incisive alveoli 14.25; condylobasal length to incisive alveoli 13.63; mastoid breadth 7.32; breadth of braincase 6.68; height of braincase 3.74; zygomatic width 9.08; width across upper canines (crowns) 3.66; width across last molars M3/-M3/ 5.96; length of upper toothrow Cs-M3/ (crowns) 5.48; postorbital constriction 3.46; length of mandible to condylus 10.59; length of mandible to proc. angularis 10.57; length of lower toothrow Ci-M/3 (crowns) 5.83. In size this Thai specimen agrees with the series collected at the type locality and being slightly larger than the two specimens from Pegu Yoma (Koopman 1970).

0044-3468/00/65/02 – 121 $ 12.00/0

The mammae are not enlarged, and no embryo is present. Neither spinturnicid mites nor nycteribiid flies were detected.

In Vietnam one *E. denticulus* was collected in a house, a second one in forest (Cao Van Sung 1976). The bamboo containing this species in Khlong Lan N. P. grew in the steep hill range of the Thanon Thongchai Mts. predominantly covered by tropical broad-leaved evergreen forest and partly with submontane broad-leaved evergreen forest.

The bamboo internode in which the present specimens sheltered was ca. 5 m above ground, 57 cm long and 9.2 cm in diameter. The thickness of the bamboo wall was 8 mm. The internode was accessible by a vertical slit of 80 × 8 mm. Below the slit was a smaller hole, which was ca. 1 cm in length. Thus, the entrance was similar to the one shown by Medway and Marshall (1970: plate 2). Almost half of the internode was filled up with water and bat guano (thickness of the guano layer: 10–15 cm). The foul-smelling water and the bat guano layer contained ca. 30 hover fly larvae (Syrphidae, length up to 3 cm), ca. 200 mosquito larvae (Culicidae) and additional unidentified Diptera larvae.

The seven bats stayed in the upper part of the internode close to each other apparently using the adhesive discs on their feet to attach themselves on the wall. This was also observed in a specimen which was placed in a semi-transparent plastic bottle stored on its side. After a while the bat was seen hanging upside down from the upper part of the plastic bottle clinging to the smooth plastic wall by its adhesive discs.

Three vespertilionid genera are characterised by flattened skulls (also found in few petrophilous Molossidae), i. e. the Afrotropical *Mimetillus moloneyi* (Thomas 1891), and the two Oriental genera *Tylonycteris* Peters, 1872 and *Eudiscopus*. Food pads in *Tylonycteris* and *Eudiscopus* are shared with *Glischropus* Dobson, 1875 of the Asian tropics, which roosts inside dead bamboo stalks with oval to elongate holes (Kofron 1994). *Mimetillus* is known to roost under the bark of dead trees (Kingdon 1974), *Tylonycteris* is typically roosting in groups inside bamboo internodes (Medway and Marshall 1970).

Walker (1964) speculated that the adhesive disks on the feet of *E. denticulus* might indicate frond and leaf roosting habits. According to Koopman (1972) the flattened skull suggests that this bat must crawl through narrow crevices and the foot pads suggest it must cling to relatively smooth surfaces. The present record documents that *E. denticulus* shares the habit of roosting inside hollow bamboo stems with *Tylonycteris*, a member of the same tribe Vespertilionini.

Medway and Marshall (1970) suggested that the holes used by *Tylonycteris* to enter bamboo internodes are made by the leaf beetle *Lasochila goryi* and are sometimes modified by woodpeckers. According to our own observations in the same area (Ulu Gombak, W. Malaysia) most entrance holes used by *Tylonycteris* are made by woodpeckers, which hunt larvae of bamboo-inhabiting leaf beetles, long-horned beetles or pyralid moths (see Kovac 1998). The entrance hole used by *Eudiscopus* was not made by *L. goryi* and was untypical of a woodpecker hole. It seems that the hole was made in an early stage of the culm development and subsequently became enlarged during elongation process of the internode.

Bamboo internodes provided with holes fill up with rain water. This peculiar aquatic habitat called bamboo phytotelma harbours a specialized arthropod animal community (Kovac 1998). In old, upright bamboo culms only a few arthropod specimens are found in a single internode. For example, in the internode next to the *Eudiscopus*-internode, which was inhabited by a frog (Rhacophoridae), we only found one semiaquatic bug specimen belonging to a new species of *Lathriovelia* (= *Baptista* sp. in Kovac 1998). Mosquito larvae or other arthropods were lacking. In contrast, the *Eudiscopus*-internode contained more than 200 specimens of Diptera larvae belonging to at least three different families. The Diptera species found in the *Eudiscopus*-internode did not occur in normal bamboo internodes investigated in Khlong Lan (n = 20) or in Ulu Gombak, W. Malaysia (ca. n = 500). This shows, that the eutrophication of the water caused by bat faeces considerably changes the composition of the arthropod community.

The thickness of the guano layer and the occurrence of various larval stages of Diptera indicate that the roost was used more or less regularly. It appears that *E. denticulus* roosts in groups as it is supported by the original collecting of six specimens at Phong Saly. The flat skull is a mere adaptive convergence to its roosting site, as it is in all other flat-headed bat genera, otherwise completely unrelated (Menu 1987). The adhesive foot pads appear to be an adaptation to the smooth bamboo walls, since all three Asian bat genera having foot pads roost in bamboo internodes.

The junior author has examined in recent years ca. 40 internodes in W. Thailand, more than 500 internodes in Ulu Gombak, W. Malaysia and about 40 internodes in Singapore, and about the same amount in Sabah and W. Sumatra. Only in Thailand *E. denticulus* was found once, while in other regions mentioned above it was always one of the *Tylonycteris* sp. Furthermore, the Ulu Gombak region was investigated very intensively by Medway and Marshall (1970). They recorded 448 roosting parties of *Tylonycteris* between 1962 and 1968. If bamboo roosting is a regular habit of *E. denticulus*, very probably its occurrence does not extend south into W. Malaysia and beyond.

Acknowledgements

We would like to thank the staff of the Khlong Lan National Park, especially Ms. Thanyalak Injansuk, for their help. The field work upon which this publication is based was supported by a grant from the Paul Ungerer-Stiftung.

References

Cao Van Sung (1976): New data on morphology and biology of some rare small mammals from North Vietnam. Zool. Zhurnal **55**, 1880–1885 (in Russian).

Dang Huy Huynh (ed.); Dao Van Tien; Cao Van Sung; Pham Trong Anh; Hoang Minh Khien (1994): Checklist of Mammals in Vietnam. Ha Noi: Publ. House "Science and Technics" (in Vietnamese).

Kingdon, J. (1974): East African Mammals: an Atlas of Evolution in Africa. **2A** (Insectivores and Bats). London, New York: Academic Press.

Kofron, C. P. (1994): Bamboo-roosting of the thick-thumbed pipistrelle bat (*Glischropus tylopus*) in Borneo. Mammalia **58**, 306–309.

Koopman, K. F. (1970): A second locality record for *Eudiscopus denticulus* (Chiroptera: Vespertilionidae). J. Mammalogy **51**, 191.

Koopman, K. F. (1972): *Eudiscopus denticulus*. Mammalian Species, no. **19**, 1–2.

Kovac, D. (1998): Die Fauna südostasiatischer Bambusphytotelmen. Mitt. internat. entomol. Ver. **22**, 127–147.

Medway, G. G.-H.; Marshall, A. G. (1970): Roost-site selection among flat-headed bats (*Tylonycteris* spp.). J. Zool. (London) **161**, 237–245.

Menu, H. (1987): Morphotypes dentaires actuels et fossiles des chiroptères vespertilioninés. 2ème partie: Implications systématiques et phylogeniques. Palaeovertebrata **17**, 77–150.

Osgood, W. H. (1932): Mammals of the Kelley-Roosevelt and Delacour Asiatic expeditions. Publ. Field Mus. nat. Hist., (Zool.) **18**, 191–339.

Walker, E. (1964): Mammals of the World. Vol. **1**. Baltimore: John Hopkins Press.

Authors' address: Dr. Dieter Kock and Dr. Damir Kovac, Forschungsinstitut Senckenberg, Senckenberg-Anlage 25, D-60325 Frankfurt a. M.